RE 410: Real Estate Finance

Spring 2017

Homework 3 – Adjustable-Rate Mortgages

Due Date: Feb. 9th, 2017

Problem 1

A fully amortizing 1-year ARM for $200,000 is made for 25 years with monthly payments. The initial composite rate is 4%, but the loan comes with a teaser rate of 3% for the first year. The loan also has a 1.5% periodic cap and a lifetime cap of 3%

  a. What will be the payment amount during the first year?
  b. What will be the payment in year 2 if the composite is 6.5% at the end of year 1? By what is the percentage increase in payment?
  c. What will be the payment in year 3 if the composite rate is now 8%?

Problem 2

A $100,000 PLAM is made for 30 years with monthly payments and a 4% fixed interest rate (real interest rate + risk premium) and 3 points. Inflation is expected to be 5% per year for the next 5 years.

  a. Compute the payment at the beginning of each year for the next 5 years.
  b. What is the loan balance at that end of the 5th year?
  c. What is be the yield to the lender if the borrower prepays at the end of year 5?

Problem 3

A $200,000 30-year adjustable rate mortgage is made at an initial annual interest rate of 12% with annual interest rate resets. The borrower and lender have negotiated a monthly payment cap of $1,600.

  a. What will be the loan balance at the end of year 1?
  b. If the interest rate increases to 13% at the end of year 1, how much interest will be accrued as negative amortization in year 2 if the payment cap remains at $1,600?

Problem 4

A borrower gets a fully amortizing 30-year, $150,000 adjustable rate mortgage with annual interest rate resets and monthly payments. The loan is priced a 2% above the 1-year Treasury rate and 2% discount points. It comes with no interest rate caps but includes a payment cap of 5% increase in any year with negative amortization permitted if the payment cap is reached. The initial interest rate on the loan is 7% and the index interest rate is forecasted at 7%, 8.5%, 9.5%, and 11% for the end of years 1 to 4, respectively. Compute the monthly payment amounts and year-end loan balances for the first 5 years. What will be the yield on the loan over that period?